

APPENDIX I

Draft environmental management programme



**PUBLIC ACCESS
REPORT**

Compiled for
WASTE GIANT LANDFILL (PTY) LTD



on behalf of
ENVITECH SOLUTIONS (PTY) LTD



**DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME
FOR THE
VLAKFONTEIN WASTE TREATMENT FACILITY**

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DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE VLAKFONTEIN WASTE TREATMENT FACILITY

Compiled by:

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EXECUTIVE SUMMARY

This environmental management programme was compiled as a requirement to Regulation 718 of 3 July 2009 that lists waste management activities in terms of the National Environmental Management: Waste Act (No 59 of 2008), read in conjunction with Regulation 543 of 18 June 2010 that stipulates the environmental impact assessment regulations in terms of Sections 24(5), 24M and 44 of the National Environmental Management Act (No 107 of 1998).

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1. INTRODUCTION

Envitech Solutions (Pty) Ltd was appointed by Waste Giant Landfill (Pty) Ltd to assist with the site selection process, site investigations and technical design for a new integrated waste treatment and disposal facility in order to facilitate the application for a waste management license in terms of the National Environmental Management: Waste Act (No 59 of 2008). They subsequently requested Softchem to complete the environmental impact assessment (EIA) process required by Regulation 718 of 3 July 2009 that lists waste management activities in terms of the National Environmental Management: Waste Act (No 59 of 2008); read in conjunction with Regulation 543 of 18 June 2010 (EIA regulations) that stipulates the environmental impact assessment regulations in terms of Sections 24(5), 24M and 44 of the National Environmental Management Act (No 107 of 1998, NEMA).

As part of an environmental impact assessment report, Section 31(2)(p) of Regulation 543: Environmental Impact Assessment Regulations, 18 June 2010; requires that a draft environmental management programme be included in said EIA report. In terms of Section 33 of the EIA regulations, in compliance with Section 24N of the National Environmental Management Act (No 107 of 1998); the components of this draft environmental management programme (DEMP) are set out below, with references to the relevant sections within this report:

- details and expertise of the EAP who prepared this report (Section 9);
- information on any proposed management or mitigation measures that will be taken to address the environmental impacts identified in Section 8 of the EIA report through the anticipated stages of this activity (Section 4);
- a detailed description of the aspects of the activity that are covered by this DEMP (Section 3);
- identification of the persons who will be responsible for the implementation of the measures contemplated in Section 4 (Sections 5);
- proposed mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon (Section 5);
- measures for rehabilitation conforming to sustainable development, including, where appropriate, concurrent or progressive measures (Section 6);
- description of any modifications, remediation, control or stopping of any action, activity or process which causes pollution or environmental degradation and to remedy the cause of pollution or degradation and migration of pollutants (Section 4);
- compliance with any prescribed environmental management standards or practices (Section 2);
- description of compliance with any applicable provisions of NEMA regarding closure, where applicable (Sections 6 and 7);
- compliance with any applicable provisions of NEMA regarding financial provisions for rehabilitation, where applicable (Section 7);
- time periods within which the measures contemplated in this DEMP must be implemented (Section 5);
- process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of this proposed activity (Section 2);

- an environmental awareness plan to inform employees of any environmental risk which may result from their work and how risks must be dealt with in order to avoid pollution or degradation of the environment (Section 8); and
- closure plans and objectives, where appropriate (Section 6).

This draft environmental management programme should be read in conjunction with the EIA report on this activity, and in particular, the operating plan proposed as part of the overall design report in Appendix K of the EIA report.

2. ENVIRONMENTAL MANAGEMENT SYSTEM

In Section 12 of the EIA report a brief introduction is given to the development of an environmental management system (EMS) in accordance with the ISO 14001:2004 standard (even if not accredited under the standard). ISO 14001 is the world's most recognised EMS framework, enabling organisations to demonstrate sound environmental management by minimising harmful effects on the environment and achieving continual improvement through a formal environmental management system, which is subject to external audit verification (Friend *et al.*, 2005). Implementation of such a system will involve, *inter alia*, the development, approval, authorisation and implementation of the following ISO 14001 aligned procedures (Friend *et al.*, 2005):

- *Environmental policy and management review procedure*;
- *Environmental management system planning procedure* (addressing environmental aspects; legal and other requirements; and objectives, targets and programmes);
- *Environmental management system implementation and operation procedure* (addressing resources, roles, responsibility and authority; competency, training and awareness; communication; documentation; control of documents; operational control; and emergency preparedness and response); and
- *Environmental management system checking procedure* (addressing monitoring and measurement; evaluation of compliance; nonconformity, corrective and preventive action; control of records; and internal audit).

Apart from an overall environmental management manual (acting as a roadmap to the complete EMS), the following documents will form part of the envisaged EMS for the proposed waste treatment facility (Friend *et al.*, 2005):

- environmental aspects and impacts register,
- environmental legal register,
- environmental objectives, targets and programme,
- environmental training register,
- environmental complaints register, and
- EMS audit schedule.

An environmental management system contemplated above will principally be developed from the following sources:

- this draft environmental management programme,
- record of decision in the event of approval for this proposed activity, and
- the operating plan contained in the design report for this facility (Appendix K of the EIA report).

Such an EMS will make use of processes, practices, techniques, materials, products, services or energy to avoid, reduce or control (separately or combined) the creation, emission or discharge of any type of pollutant or waste, in order to reduce adverse environmental impacts. It will also address the management of any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of this proposed activity in terms of Section 33(i) of the EIA regulations.

3. MEDIA TYPES AND ENVIRONMENTAL ASPECTS

The physical, chemical and biological processes that shape the global environment are fundamental to an understanding of how significant environmental problems really are. The global environment (Figure 1) comprises four linked systems (Friend, 2002):

- **atmosphere:** gases/air enveloping the earth.
- **biosphere:** that part of the earth that comprises a variety of habitats, containing all living organisms, inclusive of animals, plants and micro-organisms.
- **geosphere:** represented by the internal geological processes of the earth and the external physical features that shape the world.
- **hydrosphere:** comprises all the saltwater (94 %) and freshwater (6 %) resources of the earth.

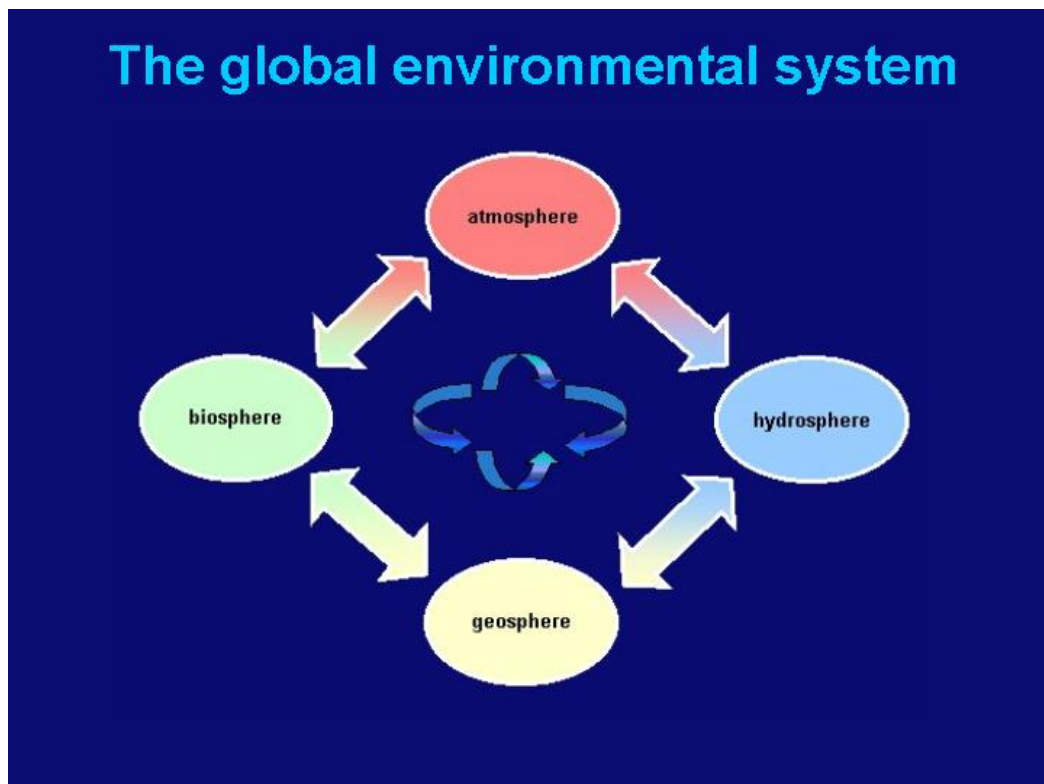


Figure 1 The global environmental system.

Each of these systems interacts with one another and the pollution sources, sinks and fluxes are controlled by specific processes that can be defined. As people have become aware of the more obvious attributes of environmental destruction, there has been a shift in priority towards monitoring and attempting to control the adverse effects of pollution. This resulted in, *inter alia*, the legal obligations enforced on companies to monitor their discharges and, regulatory authorities starting to compile comprehensive databases on the quality of the environment. (Friend, 2001)

Environmental damage to the above systems can be caused by both natural and man-made activities. The environmental effects of such activities are conveyed through the three principal media (IChemE, 1993):

- **Water** - discharges are dispersed down a concentration gradient in both freshwater and saltwater. The relative flowrates of pollutant and water, the degree of contamination and complexity of the ecosystem all have an effect on the rate of dispersal.
- **Air** - atmospheric emissions are dispersed and chemically converted to less damaging compounds. These processes are influenced by meteorological conditions, the pollutant source and the chemical and physical nature of the pollutant.
- **Land** - contaminated land can present particularly intractable problems. Ameliorating the adverse effects of pollution may only be possible by removing the contaminated material. Contaminated land can cause further problems with water courses and groundwater, thus extending the boundaries of pollution. Albeit that the third media is land, the actual field of study to address this media is normally referred to as waste management.

For the proposed Vlakfontein waste treatment facility, the media aspects will be addressed according to water, air and land/waste issues. Based on the description of the proposed waste treatment facility in Section 3 of the EIA report and the environment in Section 5 of the EIA report, the relevant aspects of this activity (classed in accordance to the three media types) are listed in Table 1.

Table 1 Aspects and media types.

Environmental aspect	Media
Geology - landfill site construction	land
Land use capabilities - landfill site construction and operation	land
Hydrology - landfill site operation	water
Air - vehicle transport and thermal destruction of waste	air
Natural vegetation - landfill site construction and operation	land
Animal life - landfill site construction and operation	land
Sensitive landscapes and visual aspects - landfill site construction and operation	land
Noise and odours - vehicle transport and landfill operation	air

4. IMPACTS AND MITIGATION

Environmental impacts are defined by DEAT (2006) as the changes in an environmental parameter that result from undertaking an activity. In order to address (mitigate) any impact on the environment, impacts must be evaluated according to acceptable criteria of assessment. The evaluation of impacts for this activity was comprehensively dealt with in Section 7 of the EIA report. These evaluations are summarised in Table 2, indicating relevant mitigation measures required to address impacts foreseen from this proposed activity.

From Section 7 in the EIA report and as required by Section 33(b) of the EIA regulations, project impacts are subdivided into the following three phases*, from which impacting activities can be identified (DEAT, 1998); :

- construction phase [CP] – all activities on and off site, including the transport of material,

- operational phase [OP] – all activities, including operation and maintenance of structures, and
- decommissioning/rehabilitation phase [DP] – any activity related to the physical dismantling of the structures and/or restoring of process/mining land to some degree of its former state.

* note that while planning and design is recognised as a project phase, it is for this project and generally for most projects, of no negative impact significance.

However, the nature of this project is such that construction, operation and rehabilitation will take place nearly simultaneously for this activity (refer Section 3 and Appendix K of EIA report). Thus impacts will not be described separately for these different phases (see also Section 7 of the EIA report).

The mitigation measures recommended in Table 2 will address the requirements contemplated by Sections 33(g)(i) and 33(g)(ii) of the EIA regulations in describing briefly the modifications, remediation, control or stopping of any action, activity or process which causes pollution or environmental degradation and to remedy the cause of pollution or degradation and migration of pollutants. More detailed explanations and descriptions are provided in Appendix K of the EIA report.

Table 2 Environmental impacts and mitigation measures.

Environmental impact	Mitigation measures
Geology - existing excavation.	Implementation of a properly engineered landfill, closure and rehabilitation.
Land use capabilities - excavated condition unsuitable for any beneficial use at present.	Implementation of a properly engineered landfill, closure and rehabilitation with simultaneous establishment of a nature conservancy on the property as part of the community's development proposal.
Hydrology - surface and groundwater pollution.	Implementation of a properly engineered landfill in accordance to latest revised waste classification system and associated water treatment plant/system for capture and effective treatment of any leachate/discharges from the facility.
Air - increased traffic can lead to excessive dust creation.	Watering of the gravel access road should be seen as a minimum requirement. However, tarring of the access road is the preferred option and the subsequent assessment below is based on the preferred mitigation option.
Air - the thermal destruction of waste produces potentially harmful airborne emissions.	Using world class equipment with associated abatement technologies should negate any adverse impacts. Adherence to the recommended buffer zones should be seen as a minimum requirement.
Natural vegetation - with required construction and operational activities of the proposed facility certain vegetation will have to be removed and disturbed.	As little as possible of the indigenous vegetation should be removed. Large trees should be retained if they are not in the pathway of the pipeline. Exotic plant species should be removed. The establishment of alien weeds in the disturbed areas should be prevented by means of mechanical and/or chemical control. The drainage lines/wetlands in the northern part of the site and the quartzite ridges/koppies in the western and southern parts should be excluded from any development.
Animal life - with required construction and operational activities of the proposed facility certain fauna will be disturbed in their natural habitat.	As little as possible of the indigenous vegetation should be removed. The drainage lines/wetlands in the northern part of the site and the quartzite ridges/koppies in the eastern and southern parts should be excluded from any development
Sensitive landscapes and visual aspects - impact on sensitive landscapes and visual impacts during construction and operational activities of the proposed activity.	No development should take place on the quartzite ridges/koppies and screening via indigenous vegetation to augment the buffer zones is recommended.
Noise - adverse noise levels due to increased traffic and operational activities	Make use of noise abatement technologies where feasible, and restrict operating hours from 07:00 to 19:00 during weekdays, and for limited periods on weekends and public holidays.
Odours - adverse odour levels due to operational activities	Make use of odour abatement technologies and mitigation measures to restrict possible odour releases.

5. RESPONSIBILITIES, MONITORING AND TIME FRAMES

It is a requirement of Section 33(d) of the EIA regulations that persons who will be responsible for the implementation of the measures contemplated in Section 4 be identified. These people have been identified in the operating plan envisaged for this proposed waste disposal facility in Appendix K of the EIA report, and presented in Table 3.

In terms of Section 33(e) proposed mechanisms for monitoring compliance with and performance assessment against the environmental management programme (EMP) and reporting thereon must be included in a draft EMP. An extensive monitoring programme is presented in the operating plan in Appendix K of the EIA report. (EVT (2011) states that the objectives of monitoring are:

- to verify that the waste treatment facility conforms to the required standards and site-specific authorisations,
- for the data that is collected from sampling to be confidently used in interpretations to determine the effects that the facility has on the environment,
- to determine whether the design and its implementation, as well as operational controls, are adequate,
- to facilitate meaningful quality assessment, risk assessment and implementation of suitable management measures if so required, and
- to provide information for future planning and prioritisation.

Section 33(h) of the EIA regulations requires that time periods within which the measures contemplated in this DEMP must be implemented be included in the draft EMP. These, together with responsible people and monitoring actions are given in Table 3.

6. REHABILITATION AND CLOSURE

The requirements with regard rehabilitation and closure in terms of Sections 33(f), 33(g)(iv) and 33(k) of the EIA regulations are addressed in the operating plan contained in Appendix K of the EIA report. Due to the nature of the activity, rehabilitation will take place on a continuous basis during the operational time of the activity. Specific legislated procedures will be followed once the closure stage of the activity is reached.

7. LEGAL COMPLIANCE

As part of an EMS, as described in Section 2 of this draft environmental management programme, legal compliance with regard all relevant legislation will form an integral part of the overall EMS. This will include, *inter alia*, keeping of legal registers, adhering to permit/licence requirements and forwarding relevant required month reports to government departments. Compliance in terms of Section 33(g)(iv) with regard any applicable provisions of NEMA regarding financial provisions for rehabilitation, where applicable; will be addressed as prescribed by relevant government authority. The relevant financial vehicle to be used for this to be determined through liaison with the relevant government department.

Table 3 Environmental impacts, monitoring actions, time frames and responsibilities.

Environmental impact	Mitigation measures	Monitoring actions and time frames	Responsibilities
Geology - existing excavation.	See Table 2.	Periodic inspections.	Client, contractor, consultant.
Land use capabilities - excavated condition unsuitable for any beneficial use at present.	See Table 2.	Periodic inspections.	Client, contractor, consultant.
Hydrology - surface and groundwater pollution.	See Table 2.	Periodic inspections and monitoring programmes.	Client, contractor, external auditors.
Air - increased traffic can lead to excessive dust creation.	See Table 2.	Periodic inspections and monitoring programmes.	Client, contractor.
Air - the thermal destruction of waste produces potentially harmful airborne emissions.	See Table 2.	Periodic inspections and monitoring programmes.	Client, contractor, external auditors.
Natural vegetation - with required construction and operational activities of the proposed facility certain vegetation will have to be removed and disturbed.	See Table 2.	Periodic inspections.	Client, contractor.
Animal life - with required construction and operational activities of the proposed facility certain fauna will be disturbed in their natural habitat.	See Table 2.	Periodic inspections.	Client, contractor.
Sensitive landscapes and visual aspects - impact on sensitive landscapes and visual impacts during construction and operational activities of the proposed activity.	See Table 2.	Periodic inspections.	Client, contractor.
Noise - adverse noise levels due to increased traffic and operational activities	See Table 2.	Periodic inspections and monitoring programmes.	Client, contractor, external auditors.
Odours - adverse odour levels due to operational activities	See Table 2.	Periodic inspections and monitoring programmes.	Client, contractor.

The legislation, policies and/or guidelines of any sphere of government that have been considered in the preparation of the scoping report, in terms of Section 28(1)(f) of Regulation 543: Environmental Impact Assessment Regulations, 18 June 2010; read in conjunction with sections 24(5), 24M and 44 of the National Environmental Management Act (No 107 of 1998); are presented in Table 4. This will represent a starting point for the compilation of the legal register, as part of an overall EMS. Naturally more legislation is applicable once addressing operational issues at the proposed waste treatment facility.

8. ENVIRONMENTAL AWARENESS

One of the preeminent requirements of an EMS is the setting up of an environmental awareness plan, as contemplated by Section 33(j) of the EIA regulations. Apart from addressing the requirements of Section 33(j) to inform employees of any environmental risk which may result from their work and how risks must be dealt with in order to avoid pollution or degradation of the environment, such a plan will contain, *inter alia*, the following elements:

Table 4 Applicable legislation, policies and/or guidelines.

Title of legislation, policy or guideline:	Administering authority:	Publication date:
Air quality activities regulations No 248	National and provincial	31 Mar 2010
Air quality standards regulations No 1210	National and provincial	24 Dec 2009
Conservation of Agricultural Resources Act (No 43 of 1983)	National and provincial	21 Apr 1983
Constitution of the Republic of South Africa Act (No 108 of 1996)	National and provincial	18 Dec 1996
Development Facilitation Act (No 67 of 1995)	National and provincial	1995
EIA Regulations Nos 543, 544, 545 and 546	National and provincial	18 Jun 2010
EIA Regulations Nos 660, 661, 662, 663 and 664	National and provincial	30 Jul 2010
Environment Conservation Act (No 73 of 1989)	National and provincial	1 Jun 1989
National Environmental Management Act (No. 107 of 1998)	National and provincial	27 Nov 1998
National Env Management Amendment Act (No 56 of 2002)	National and provincial	15 Jan 2003
National Env Management Amendment Act (No 46 of 2003)	National and provincial	13 Feb 2004
National Env Management Amendment Act (No 8 of 2004)	National and provincial	14 Jul 2004
National Env Management Amendment Act (No 62 of 2008)	National and provincial	3 Jan 2009
NEMA implementation guidelines Notice 603	National and provincial	18 Jun 2010
National Env Management: Air Quality Act (No 39 of 2004)	National and provincial	24 Feb 2004
National Env Management: Waste Act (No 59 of 2008)	National and provincial	10 Mar 2009
National Heritage Resources Act (No 25 of 1999)	National and provincial	1999
National Water Act (No 36 of 1998)	National and provincial	26 Aug 1998
Occupational Health and Safety Act (No 85 of 1993)	National and provincial	23 Jun 1993
Promotion of Access to Information Act (No 2 of 2000)	National and provincial	2000
Waste management activities regulations No 718	National and provincial	3 Jul 2009

- conducting an environmental training needs analysis at least once every two years (or earlier, if a management review indicates a need for such an analysis) to ascertain the level of environmental awareness of personnel;
- the identification of training needs and the frequency of testing competence and/or environmental awareness of employees, contractors and/or suppliers will be in accordance with guidelines set by the company;
- the attendance of an induction course on Environmental Awareness by all personnel, included in this prescribed induction process will be new employees, contractors and/or suppliers;
- making personnel aware of the importance of conformance with the company's environmental policy and procedures and with the requirements of the environmental management system; the significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personal performance; their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system, including emergency preparedness and response requirements; the potential consequences of departure from specified operating procedures; and the relevant procedure in the event of complaints received from external parties;
- ensuring that all personnel whose work may create a significant impact on the environment will receive and be competent on the basis of appropriate education, training and/or experience; and
- incorporation of required training of personnel in the environmental training register, and personal records of employees updated accordingly once specified training has been completed.

9. DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

In terms of Section 33(a) of Regulation 543: Environmental Impact Assessment Regulations, 18 June 2010; read in conjunction with sections 24(5), 24M and 44 of the National Environmental Management Act (No 107 of 1998); it is a requirement to provide details of the environmental assessment practitioner (EAP) who prepared the report and the expertise of the EAP to compile an environmental management programme. Brief information in this regard is given below, with more detailed qualifications, experience and related publications available in Section 11 of the EIA report.

Name: John Francois Curling Friend
Education: BEng (Chem) Pretoria 1986
MSc (Eng) Cape Town 1991
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Affiliations: FSAIChe (Fellow, South African Institution of Chemical Engineers)
FIChemE (Fellow, United Kingdom Institution of Chemical Engineers)
FWISA (Fellow, Water Institute of South Africa)
FIWM(SA) (Fellow, Institute of Waste Management of Southern Africa)

Registrations: PrEng (Professional Engineer, Engineering Council of South Africa)
CEng (Chartered Engineer, United Kingdom Engineering Council)

Specialisation: Water management, treatment and recycling. Air quality and waste management. Environmental management, economics, assessments and auditing. Technical audits and effluent treatment. Specialised computer applications.

10. REFERENCES

DEAT (DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM) (1998) EIA regulations – implementation of sections 21, 22 and 26 of the Environment Conservation Act. *Department of Environmental Affairs and Tourism guideline document*, April 1998, Pretoria.

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